



Successful Prescribed Burns Require Careful Planning

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The character of most forests in the South has been shaped by fire. Since lightning, Indians and early settlers frequently started woods fires, plants either adapted to fire or became extinct.

After a period of trying to exclude fire, foresters recognized its value as an ecological force and its necessity as a management tool. Today, prescribed burns — fires set under planned conditions to accomplish specific management objectives — are used on over 5 million acres in the South each year. Although most prescribed burning is done to reduce hazardous fuels, it is also used to control disease and competing vegetation, prepare sites for seeding and planting, and to improve wildlife habitat, grazing, appearance and access.

Prescribed burning is an effective tool but, because of potential hazards, should be conducted only by well-trained, experienced personnel. Each burn is affected by a unique set of stand, fuel and weather conditions and, therefore, requires careful planning. Several planning concepts are discussed here, but for more information we suggest *A Guide for Prescribed Fire in Southern Forests* and *Southern Forestry Smoke Management Guidebook*. These publications may be obtained from the U.S. Forest Service, 1720 Peachtree Road, N.W., Atlanta, Georgia 30367.

The Prescription Process

A clear description of management objectives is prerequisite to all other planning steps. Both primary and secondary objectives should be stated. If, for example, the primary objective is to provide deer browse, and the secondary objective is to control understory hardwoods, several burns at intervals of



Strip head fires are often used to control understory hardwoods and reduce hazardous fuels.

Two to six years may be prescribed. If the primary objective is conversion of hardwood stands to pine, a hot broadcast burn during the summer following logging would be prescribed to make planting of pine seedlings easier and less expensive.

A written description of the burn unit should include its location and size, fire history and a complete description of the overstory, understory, fuels, soil type and topography. Units should be small enough to be burned completely under one set of burning conditions, usually within a day. A unit's size may vary from less than one to several hundred acres depending on management objectives, firing method, laws and regulations, and available personnel. A detailed map should be available showing fire lines, areas that should not be burned, escape routes and a diagram of the firing method.

Where firebreaks do not already exist, fire lines should be established, usually by plowing before burning as close to the burn date as possible. To reduce erosion, fire lines should be shallow and on the contour in hilly terrain. Water bars should be constructed on steeper fire lines. Lines should be as straight as practical and sharp corners should be avoided.

A burning prescription should state the year and season of burning, and the desired weather and fuel conditions. Selection of the best year depends on vegetation size and management objectives. Burning every year, for example, provides a high degree of protection to overstory trees but is usually impractical. In the Southeast, areas are commonly burned every two to four years to reduce fuel buildup and minimize danger from wildfires.

Season of burning is related to fire intensity and the stage of vegetative development that will best suit management objectives. Cool winter burns are common for reducing wildfire hazard and controlling understory vegetation. Spring burns are difficult to conduct because of variable weather conditions and interference with wildlife breeding seasons; however, they

effectively kill small vegetation which is rapidly growing and highly susceptible to fire. Summer burns are most effective at killing competing vegetation, reducing fuel buildup, and preparing seedbeds and sites for planting; however, they pose the highest risk to overstory trees.

Selection of the specific day to burn can be the most difficult step in fire planning because numerous fuel and weather conditions must be considered. Accurate weather forecasts on the burn day are essential. The range of acceptable weather conditions is generally so narrow that burning can be conducted only during a portion of a day.

In the Southeast, weather acceptable for understory burning commonly occurs in the winter, one to three days after a cold front passes. The cold front is typically accompanied by rainfall and is followed by steady northwesterly winds, low temperatures and low relative humidity. Logging residues are generally broadcast burned in the summer. The presence of cured fuels resulting from herbicide application or felling of unmerchantable trees left after logging allows burning soon after a soaking rain.

The choice of firing method is determined by the desired fire intensity. Head fires (those that travel with the wind or upslope) produce high temperatures and tall flames. These burns are effective where fuel loading is low or for site preparation where there is no overstory to protect. Head fires are often ignited in strips (called strip head fires) to speed the burning process and to reduce fire intensity. Strip head fires are commonly used for understory burning. Backing fires (those that travel against the wind or downslope) produce relatively cool temperatures and short flames. Although safer than head fires, backing fires are more expensive because they move slowly. Flanking fires are set parallel to wind direction and move into the wind. They are most commonly used to supplement other burning techniques.

Several firing methods combine the effects of head, backing and flanking fires. The spot fire, ring fire and chevron methods are described in *A Guide for Prescribed Fire in Southern Forests*. An experienced fire manager must select a firing method for a given set of objectives and conditions but remain flexible, changing the technique as necessary to allow for unexpected stand, fuel or weather conditions.

Local, State and Federal Laws

Fire managers should be familiar not only with technical aspects of prescribed burning, but also laws and regulations governing fire use. Fire can destroy property or cause injuries, and smoke can be a health or safety hazard. State forestry agencies should be contacted to determine the current local laws which apply to your area.

Laws concerning prescribed burning generally deal with air quality control or wildfire prevention. Most southern states require a written permit or some form of notification to forewarn state forestry agencies or local fire departments. Many states have specific restrictions: several prohibit burning near specific land-use areas (such as residential or recreation sites), some restrict burning to daylight hours, and others restrict burning during some portion of the year (particularly during the fire season). Almost all southern states prohibit burning during droughts.

Laws also exist concerning civil liability for personal injury and property damage. Any person conducting a prescribed burn is liable for damages resulting from the fire itself or the smoke it produces, regardless of whether a law has been broken. In several states, the landowner is liable to the fire-suppression organization for firefighting costs when a prescribed fire escaped.

Smoke-Management Guidelines

The practice of prescribed burning includes responsibility of wise use, land stewardship and being a good neighbor. Guidelines for smoke management are now available in the *Southern Forestry Smoke Management Guidebook*. A brief introduction to smoke management is presented here, but managers should become thoroughly familiar with the guidebook before burning.

Most southern states have voluntary smoke-management guidelines which are intended to be useful without being excessively restrictive. A few states restrict the issuing of burning permits during periods of high air stagnation and most restrict the use of rubber tires, asphalt and other hazardous smoke-producing agents for starting fires. Many states have rules which address the amount of soil in burned windrows; prevention of smoke hazards near roads, airports, and residential areas; and curtailment of burning when air is heavily polluted.

The impact of smoke can be reduced by burning under proper weather conditions. Burning should be conducted when wind is moving away from sensitive areas such as highways and homes. The atmosphere should be slightly unstable for optimum smoke dispersal without loss of control of the fire. Burning at night should be avoided because visibility is poor and smoke tends to hang low to the ground rather than being dispersed.

On the day of the burn, the fire manager should check with pollution control agencies about pollution alerts or temperature inversions. If none exist, a small test fire should be set to determine the direction and behavior of smoke. Areas next to roads should be burned quickly and when road use is low, mop-up should follow as soon as possible. Where possible, burning should be conducted in small blocks and with backing fires to minimize the volume of smoke produced. □

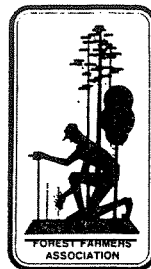
Prescribed burns should be conducted when winds are moving away from sensitive areas such as roads.



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